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Case of Hydrocephalus Internus which terminated favourably.

By Dr. Fleming Bates.

Occoquan, Seventh Month, 19th, 1808.

Esteemed Friend,

ENCLOSED I have sent for thy perusal, a statement of the case of our little patient, Andrew Ellicott. I have endeavoured to give an accurate statement, but if it should appear that I have inadvertently fallen into any error, or omitted any circumstance of material importance, thy own knowledge of the case will enable thee to correct it, which I request thou mayest do. I feel a degree of satisfaction in commencing a plan of treatment that was proper, but to thee exclusively belongs the merit of continuing it to that point which ensured success.

With sentiments of high respect,

I am sincerely, thy friend,

FLEMING BATES.

Dr. Spence.

CASE.

ANDREW ELLICOTT, a child six years old, of a remarkably strong, robust constitution, and plethoric habit, endowed with an understanding much above his age, and accustomed to use much exercise, on the twelfth of December 1807, had fatigued himself much at play. In the evening he had an ague, which was soon succeeded by an ardent fever, violent pain in the head, restlessness and delirium; these symptoms continued till towards morning.

Dec. 13th. In the morning his fever in some degree remitted, but his pulse continued full and tense, his tongue was covered with white mucus, and his eyes appeared inflamed. On examination, his body was found covered with an eruption much resembling flea bites. He took six grains of calomel and eight of jalap in the morning, but they did not operate on his bowels till late in the day, and he then had but two small discharges which were of a very dark bilious appearance. Through the course of the day he was almost constantly delirious, and at eleven o'clock P. M. he was utterly insensible of external objects, his pulse seemed much oppressed, a glow of heat pervaded the whole system, his face was flushed and almost purple, and in breathing he much resembled a person labouring under apoplexy. From twelve to fourteen ounces of blood were taken from his arm, and an injection was administered, in which a scruple of nitre was dissolved. His breathing soon after became easier, the heat of his skin moderated, his pulse became more regular and free, and he rested without much disturbance till morning.

14th. At eight A. M. he became very restless and his fever rose; I gave him two or three nauseating doses of vin. antim. at short intervals. His restlessness and anxiety increased, his pulse became exceedingly languid and irregular, and he puked at times a considerable quantity of dark green bile. A saline draught was administered which seemed to compose his stomach, and he then took nitre in all his drink; several injections also in which nitre was dissolved were administered in the course of the afternoon, which procured two or three small bilious discharges. His fever notwithstanding increased, and the delirium became more alarming. When aroused, he had a wild staring look, and his eyes were much inflamed, but he lay generally with them half closed, and in this state large drops of tears were seen frequently to trickle down his cheeks.

At three o'clock P. M. he was bled, but not more than three ounces of blood could be obtained. The nitrous drink was continued, and in the evening a blistering plaster was applied to the back of the neck. I also administered two injections in the night. At eight P. M. he had an exacerbation; for half an hour afterwards he seemed insatiably thirsty, his cheeks then became flushed, his pulse full and strong, and he lay in a comatose state till near ten, he then became very restless, made almost incessant moan and frequently applied his hand to his head. At eleven a sweat appeared, which extending to his extremities seemed to afford relief, and he appeared more quiet till morning.

15th. At eight A. M. a strabismus is observed in his right eye, his face is much flushed, and he is almost constantly delirious; we gave him twenty-four grains of jalap, which operated but twice, the discharges were small in quantity and

of a very dark bilious appearance. About eight o'clock in the evening he appeared more rational, but his face was still flushed and his pulse full and very quick. I had his head shaved, to which I applied a large blistering plaster; plasters were also applied to his legs, and sinapisms to the soles of his feet, and he took four grains of calomel; he was very restless during the night but the symptoms did not essentially differ from those before noticed.

16th. His eyes this morning are highly inflamed; nay blood-shot; the squinting is more remarkable; the pupils more dilated; head hot; face much flushed; extremities cold; pulse 120 and strong; very comatose. These alarming symptoms induced his father to send for Dr. Spence. He arrived at ten in the forenoon and soon after his arrival opened the jugular vein. From this vein and the arm fourteen ounces of blood were drawn, and a cathartic powder ordered, of jalap fifteen grains, gamboge two grains, and calomel four grains, to equalize the excitement. He also directed his feet and legs to be put in warm water, and afterwards well rubbed and wrapped in flannel: his head and shoulders to be elevated; the dressings removed from his head; a folded piece of cloth dipped in cold vinegar and water applied to it and kept wet. Soon after this process was commenced the colour forsook his cheeks; he breathed quick; the pulse became languid; beat 130; he was restless; and his left arm in constant motion: When these symptoms of extreme debility first appeared, the wet cloth was removed from his head, when they became more alarming; a warm brick wrapt in flannel was applied to his feet, his abdomen was fomented with warm spirit, and he took now and then a spoonful of warm wine whey. He was restless till about eight in the evening when his skin became soft and he slept. During this critical night Dr. Spence sat

up with him and carefully watched the varying symptoms of the disease, regulating his practice accordingly.

17th. A great change for the better. The strabismus and inflammation of the eyes are almost entirely removed; but the pupils still continue dilated; he is capable however of distinguishing his attendants. He took half a portion of the cathartic powders prescribed yesterday, and in the evening he had several passages, and the violence of the symptoms seemed much abated; towards night however although he retained his reason and the strabismus had entirely disappeared, he became extremely restless, screamed violently, and had strong spasms by which his head was drawn backwards like a person affected with opisthotonos. The spasms were not of long duration, and did not appear to affect the muscles of his jaw or his arms, but they recurred frequently. In the intervals of relaxation he complained much of his blisters, he also rubbed his nose frequently and said he wished to sneeze but could not. His pulse about this time beat 95 to the minute. After dressing his blisters and applying two others to his arms, he became more composed and rested pretty well through the night; at one time he lay an hour and an half and slept quietly.

18th. His pulse 106. He is still affected with spasms by which his head is drawn backwards, but not so violently as it was last evening. He took the cathartic powder as prescribed on the seventeenth, and it was directed to give him frequently afterwards a draught of the infusion of senna and cream of tartar. In the evening he had several discharges, but they are still of a very dark colour. The violence of the symptoms however is much diminished.

19th. This morning the patient in every respect appears much better. He has an appetite for food. There was a flushing of his cheeks early in the morning, but it was attributed to his fretting during the time of having his blisters dressed, which discharge freely, and of which he complains very much. The flushing disappeared in a few minutes after having a wet cloth laid on his head. He had last night a considerable discharge of hardened scybala. The use of the infusion of senna and crem. tart. was continued, which procured several discharges in the course of the day.

20th. Pulse 115 at eight A. M. The patient is restless and often applies his hand to his head exclaiming, O! my head, my head! his right eye is inflamed and the pupils of both are much dilated. The admission of light excites pain so acute as to make him scream; he has a wild appearance and the flushing of his cheeks is very considerable. It was directed to give him very freely of the infusion of senna and crem. tart. About two P. M. the cathartic operated; the discharges were more copious than any preceding since the accession of his disease; it appeared to afford relief and he slept quietly an hour. Seven P. M. his blisters are much inflamed and fret him exceedingly; he complains of pain in his eyes and cannot bear the light; his face is flushed and the temporal arteries throb strongly, his pulse beats at the wrist 100 per minute. For several days past his urine has been very copious, clear as fountain water, and deposits no sediment. His tongue which has been much furred from the commencement to this time is becoming clean.

21st. Pulse at the wrist and temporal artery one hundred per minute, and much stronger than it has been since he was bled. His cheeks also are considerably flushed. It

was directed to give him nitre dissolved in his drink in the morning and the infusion of senna and crem. tart. in the afternoon. About three P. M. the patient had several copious discharges which have a natural appearance. His pulse beats 90 to the minute, his skin feels cool, and there is but little flushing in his cheeks; the wet cloth has been applied to his head the greater part of the day. Nine P. M. he is quite mild and cheerful, has a good appetite, and sat up and eat a biscuit. The light is yet painful to his eyes, though they do not appear inflamed. We discover he is a little dull of hearing.

22d. Eight A. M. pulse 95. Gave him the infusion of senna and crem. tart. which operated about twelve o'clock. He slept all the early part of the day. Seven o'clock P. M. the patient is very cheerful, appears free from fever, and has a good appetite. His blisters are healing.

23d, and 24th. Symptoms appear favourable. The patient is able to set up, is nearly free from fever, and has a good appetite.

25th. The symptoms of this day mark a distinct era in the history of this patient's case, and as their diurnal periods were preserved with remarkable regularity through all the subsequent stages of the disease till its termination, I conceive it unnecessary to follow the daily journal further. In this place I shall make a few general remarks as they apply to both stages of the disease, and then proceed in a summary manner to give an account of the disease in its last stage.

The torpor of the patient's bowels from the commencement of his illness till the disease terminated, was very remarkable. From the twelfth of December to the twenty-first of January, he had not (I am fully persuaded) a single passage that was not promoted by injections or the cathartic medicines he took.

It has been mentioned that the patient had copious discharges of limpid urine in the first stage of his illness. He continued to have such discharges till the disease terminated.

In the stage which I am now about to describe, the patient was generally cheerful in the morning, his pulse was full but irregular, varying sometimes in the course of an hour from 95 to 115 or more. His mental faculties were in full perfection; indeed those who were acquainted with him before, and during his illness, observed, that his perceptions were more clear and distinct, and his ideas more sprightly than they had been while he was in perfect health.

A flushing of his cheeks was generally remarkable in the morning, the pupils of his eyes were dilated, and the admission of light continued to be painful to him.

As evening advanced he became less cheerful. The flushing of his cheeks disappeared, a drowsiness came on which soon increased to a profound sleep; a torpor now seemed to pervade his whole system, his extremities became cold, his pulse small and irregular, varying frequently in a short time from 64 to 80. In this state he generally lay several hours: he then began to move his lips, open his mouth, and thrust out his tongue as if he was endeavouring to remove

from the organ of taste something disagreeable. This symptom invariably announced an afflicting scene of human misery; starting suddenly from his lethargy he was alive only to the most painful sensations. His head was the seat of all his sufferings, his head was the constant theme of most heart-piercing lamentations. This scene of torture and crying distress generally continued about three hours; its most frequent period of accession was nine o'clock at night, but in the course of his illness it varied from four in the evening to two in the morning.

His tortures uniformly continued till the increased excitability of the system overcame the torpor, and restored energy of action to the heart and arteries. Then he became easy, and the train of symptoms proceeded regularly to the accession of the next paroxysm as before related.

The torpor of his bowels rendered it necessary frequently to administer cathartics; except when he was under the operation of these, he took alternately once in four hours during the continuance of the febrile state, ten drops of the saturated tincture of digitalis, and one grain of calomel. Blisters while they were drawing appeared to be of eminent service in diminishing the violence of the nocturnal paroxysm, but it was only while they were drawing that they appeared to be of service.

In the course of his illness he had not less than twenty blisters drawn on different parts of his system.

From the twenty-fifth of December to the tenth of January the diurnal revolution of symptoms recurred with great regu-

larity. On the tenth of January his bowels were in a constipated state, and he took a cathartic in the morning which did not operate till the accession of the nocturnal paroxysm. The operation then was excessive and he appeared in imminent danger of sinking under it. During the continuance of the febrile state which succeeded, the flushing of his cheeks was not so remarkable as it had been, his pulse was less tense and frequent than usual, the pupils of his eyes were more contracted and he could better bear the admission of light. The small doses of calomel were now omitted, but the tincture of digitalis was given during the continuance of his fever. When the action of the arterial system began to abate, we gave him six drops of Fowler's mineral solution, with directions to repeat it three times a day, and also to administer in the intervals between giving these doses, a few spoonfuls of the decoction of red bark.

These medicines were given daily, from the tenth of January, to the seventeenth of that month without affecting any material change in the disease, little or nothing was gained and the issue of the disease remained seriously to be dreaded. On the seventeenth of January, at the approach of the evening paroxysm, he took an opiate in a large dose. This appeared to have a very salutary effect. The accession of the paroxysm was protracted much beyond the ordinary time and the symptoms were much milder than usual.

He continued to take Fowler's mineral solution, and the decoction of bark, and at the approach of each succeeding paroxysm, the opiate was given. The effect was uniformly salutary, the violence of the symptoms was subdued, and the fits so far exceeded their usual periods of accession, that at

the accession of the fourth fit, from the time the opiate was first given, the patient had gained a whole day, and he had no returns of them afterwards.

He was now much emaciated and reduced to a state of extreme debility. By the use of tonic medicines he had regained so much strength by the fourth of February, as to be able to walk without support. On this day he was affected with an erysipelatous inflammation of his face and side of his head, which again deprived him of the use of his limbs, and confined him to his bed for about a week; when the fever attendant on this inflammation ceased, it was discovered that his faculty of hearing was materially impaired. The deafness continued about a month, or till the first week in March, when the erysipelas again appeared on his face and head, with this he was again confined a few days; but when he recovered from the fever his hearing was perfectly restored.

From this time his strength was daily improved, till his health was perfectly re-established, in the full enjoyment of all his faculties.

Some late Experiments on Cuticular Absorption. Read to the Philadelphia Medical Lyceum, January 3d, 1810. *By* JOSEPH KLAPP, M. D.

Mr. President and Gentlemen,

AT one of our meetings of last winter, I had the honour of reading to you an Essay on the Insensible Perspiration of the Skin. I must now beg your indulgence on an experimental inquiry, into a more extensive physiology of the same important organ. You are aware, that it has long been a question, whether the surface of the human body, performs the office of absorption, which question, I shall now proceed to examine,

..... and truth alone
Shall be our chosen theme, our glory to the last....*Cowper*.

One pound of rubia tinctorum, was boiled in a gallon and a half of water during two hours and then intimately mixed with thirty-four gallons of pump water, whose temperature had been increased, by heating it over the fire, so as to make it comfortable to the feelings.

R. E. a healthy young man stripped off his clothes, voided an ounce of urine, and lost from his arm two ounces of blood; then immersed himself into the bath, whose temperature fluctuated during his continuance in it, between the ninetieth and the seventy-fifth degree of Fahrenheit. The atmosphere stood at the seventy-eighth degree. He remained in the bath three quarters of an hour, before any inconvenience was experienced, when a little smarting here and there, on the skin ensued, and a few minutes previous to the conclusion

of it, some nausea occurred. The extent of the immersion was precisely one hour and a half, after the discontinuance of which, two ounces of urine, were received in a wine glass, the penis having been previously washed, so as to prevent any of the bath from mixing with the urine. Two ounces of blood were again taken from the arm. Portions of urine were also voided in separate glasses, at each of the two subsequent hours. The four different collections, comprising that which was voided before going into the bath, and that after coming out of it, were placed side and side of each other. The yellow colour of the two last portions of urine was deeper than that of the others, next to which was that discharged before going into the bath, and of course the most colourless, or rather the portion of the weakest yellow, was that voided immediately, after rising out of the bath. Some of the solutions of the volatile alkali, and the sulphat of iron, were next dropped in the collections of urine successively, in the order they were discharged, and that which was contained in the two first glasses, underwent no change of colour from either of the agents, the two last collections of urine instantly assumed a red colour, from the alkali, but were not in the least changed by the iron. The serum of the two different portions of blood, having been carefully poured into different glasses was subjected to the action of the same tests, without perceiving the least change of colour.

Three gallons of a strong decoction of rhubarb, made by boiling one pound of the bruised root of rad. rhæi two hours, in three gallons of water, were intimately mixed with thirty gallons of common pump water. R. E. the subject of the first experiment, and of many subsequent ones, having voided a few ounces of urine in a wine glass, stripped off his clothes, and went into the bath, raised by heating the water

over the fire to the temperature of ten degrees. While in the bath, friction was freely applied to the sides of his body with the hand, with the view of favouring an inhalation through the skin. The temperature of the atmosphere was seventy degrees. The immersion was continued one hour and a half; after raising out of the bath, about three ounces of yellow urine was discharged in a wine glass, the genitals having been previously washed. At each of the two succeeding hours, a similar quantity was voided in different glasses. The glasses containing the several collections of urine, were next placed side of each other on the table, when it was very perceivable that the first voided, was of the strongest yellow colour, the second being somewhat paler, and the third and fourth having a slight tinge of red. The solution of alkali added to portions of these different collections, produced no effect on the first and second, but the third and fourth immediately assumed a deep red colour. The sulphat of iron, when added, occasioned no change.

The above experiments prove the passage of madder and rhæi into the system only, and not the precise parts through which they passed. Their having been first applied to the surface, no more proves their having been absorbed through it, than the passage of spirits of turpentine, garlic, and other articles into the system after their application to the skin, proves their having been taken in by cuticular vessels. Like those articles, madder and rhubarb may pass into the system, after their application, as in the above experiments in the following different ways.

1st. Their substance may rise from the bath in vapours, and be inspired by the lungs, and in this way be absorbed into the general circulation.

Or 2dly, they may pass into the bladder through the urinary passage of the penis, and into the lower part of the rectum by the anus, and from thence be absorbed into the system generally.

These supposed methods of the conveyance of the above articles into the system, were in the following manner subjected to the rigid test of experiment.

A young gentleman, after having voided three ounces of urine in a wine glass, began to inhale into his lungs, the vapours of a strong decoction of madder continued during the experiment at the temperature of one hundred degrees. The decoction was constantly, but gently agitated with the view of favouring the disengagement of the vapours. The process was continued one hour and a half, at the expiration of which time, some urine was received in a wine glass, and in one hour and a half more, an additional portion was also collected. A few minutes after the discontinuance of the inspiration of the vapours, the subject of the experiment was so much indisposed with pain in the head and breast, as to oblige him to go to bed. His indisposition, however, in four or five hours subsided. Of the three different collections of urine which were made in this experiment, little or no difference in colour could be perceived, and on adding the tests to them, no change ensued.

The result of this experiment is unfavourable to the idea of the evaporation, and the absorption of the madder and rhubarb by the lungs; we will in the next place ascertain how far the second supposition is consistent with the truth.

A piece of white linen was laid over the genitals, and the anus, which was secured by such an extent of adhesive plaster, as embraced the skin for several inches around those parts so closely, as to effectually exclude the access of the bath from them. Thus situated, I gradually immersed my whole body in a strong decoction of the madder; the temperature of the atmosphere was seventy-five degrees, and that of the bath fluctuated between the eighty-fifth and the ninety-fifth degrees of Fahrenheit; the immersion was discontinued, when one hour and a half had transpired. Immediately on rising out of the bath, a few ounces of pale urine was voided, which underwent no change of colour on the addition of either of the tests; in one hour the urine discharged was of a deep yellow, and instantly assumed a red colour, on adding to it some of the solution of pure soda. The sulphat of iron produced no change.

Thus it appears that madder and rhubarb when applied to the surface of the human body in the form of a bath neither obtain admission into the system by the pulmonary organs nor by the rectum.

It is very commonly asserted by chemists that the colouring matter of madder does not rise in distillation, if so the supposition of its absorption by the lungs would be at once sufficiently disproved. But it is possible it might rise in distillation, and yet not from the bath as the temperature is much less.

One pound of powdered turmeric, was gently boiled two hours in a gallon of water, and afterwards poured into thirty two gallons of common water, which formed a bath of a deep yellow colour. A young man in good health after voiding two ounces of urine in a wine glass, and after having lost

from the arm a similar quantity of blood, went naked into the bath and continued in it three hours. In an hour after the immersion he complained of sickness at the stomach, at one time gagging, or an effort to vomit ensued, in the course however of the succeeding hour, the sickness entirely subsided. His skin was soon died of a fine yellow colour. The temperature of the atmosphere was sixty-eight degrees, and that of the bath fluctuated during the course of the immersion between the eightieth and ninetieth degree. On the second hour from the beginning of the immersion, some urine was received in a wine glass after having washed the prepuce and glans penis so as to prevent any of the curcuma from passing into the glass with the current of urine. At the close of the bathing a small quantity of the urine and of the blood was again received as before going into the bath. And at the expiration of two hours urine was also collected. The result of a fair comparison of the different portions of urine was as follows; that which was voided before the immersion possessed the straw colour more than any of the others. Some of the solution of pure soda was next poured into them all beginning with that first voided, which test produced no change of colour in any of them. In neither case did it occasion that reddish colour which any of the alkalis will, when added to an infusion or decoction of the curcuma. The serum of the portion of blood taken before going into the bath, and of that taken immediately on coming out of it, was of the same colour and appearance. In both cases it was transparent, and the alkali was incapable of developing a red colour.

The non-absorption of turmeric naturally inclines us to suppose that it cannot be the colouring matter of rhubarb and madder alone which is conveyed in through the skin, since the colouring matter of the curcuma is more distinct and pe-

haps stronger than that of either of those two articles. Why some articles do pass through the skin, and others are excluded will be perhaps a very difficult point to determine. It may however throw some light on the present obscure state of the subject, to pursue the question a little further, and although we may not be so fortunate, as to disclose the true cause yet we may make the inquiry less difficult to those who may afterwards undertake it.

The circumstance of madder and rhubarb, having in their composition more or less of the astringent principle, and curcuma not, forms a difference in their properties which it would be reasonable to suppose would occasion some difference in their operation on the skin. The conjecture will perhaps derive additional support, by calling to mind the theory of the late ingenious Darwin, respecting the modus operandi of astringents. He supposed that all astringent substances are particularly conducive to absorption, and that this primary operation was to stimulate or increase the action of the absorbents. If we were all united in the opinion, that madder and rhubarb are taken into the system through the skin by the operation of lymphatic absorbents actually existing on the cuticle, though never discovered, the hypothesis of Dr. Darwin, would supply us with the explanation why substances, impregnated with the astringent principle are absorbed, and why many others which have been used, and which do not contain that principle do not pass through. But a diversity of opinion on the nature of the process, by which the above mentioned agents pass through the external surface, and the issue of a few experiments, presently to be stated, render this explanation at the present time rather objectionable. If the astringent principle be very

conducive to the passage of substances through the skin, it would be natural to calculate that all such substances as contain most of it would be imbibed in the most eminent degree. In order to try the strength of this calculation, I resolved to institute an experiment with a decoction of galls. I was the more encouraged in making this experiment, as at the time I happened to recollect the case of a little patient, which had fallen under my notice, eighteen months previous, and who had voided urine of a purple colour while using an astringent mixture, composed principally of galls. This rather I believe unusual occurrence, made only a slight impression on my mind at the time the observation was made, and perhaps had it not been for the present inquiry I should never have again adverted to it. I wished to ascertain if I could, what was the cause of the purple colour of the urine, voided by this patient. A small quantity of an infusion of the powdered galls, was added to some urine in a wine glass, but without producing any change of colour. Some was next added to the serum of the blood, with nearly the same effect, at least the mixture merely became turbid without being followed by a change of colour. Suspecting that the red globules of the blood, or their feruginous matter might by uniting with the gallic acid of the galls, develope the colour in question, I received some blood directly from the arm into a bowl, containing some of the gall infusion; with the intention of noticing the colour of the serum after it would separate from the crassamentum. But in this I was unexpectedly disappointed as the blood did not afterwards coagulate, but remained in a dissolved state until it was thrown away, which was fourteen hours from the time it was taken from the arm. That this fluidity of the blood was not owing to any previous diseased state, but owing to the action of the galls, I ascertained by receiving a few ounces of the blood at

the same time from the arm in a tea cup, which coagulated in the usual time. Having in these experiments been disappointed, I next began to take into my stomach, a grain of powdered galls in the form of pills, every hour, with the design of continuing it, until I should be satisfied of having taken a sufficient quantity, to ascertain whether it was a fact, that the urine is made purple by its use. But after taking six pills, I was constrained to omit taking more of them on account of a very severe pain, which they produced in my stomach, and in different parts of the intestinal canal. Notwithstanding I was thus repeatedly baffled in my endeavours, to elucidate this point, I conceived it would not be improper, to pursue the subject a little further, by bathing in a mixture of curcuma and galls, by which I propose ascertaining the agency of the astringent principle on the function in question. Should the gallic acid carry the curcuma through the surface into the general circulation it can easily be detected in the urine by the use of either of the alkalis. Agreeably then to this arrangement one quarter of a pound of bruised galls were gently boiled in half a gallon of water during two hours, after which the boiled liquid, was intimately mixed with thirty-two gallons of a decoction of turmeric. R. E. after having voided in a wine glass an ounce of urine, stripped off his clothes, and immersed his whole body in the bath, whose temperature at different examinations, librated between the eighty-ninth and ninety-third degree of Fahrenheit. The temperature of the air of the atmosphere was seventy-eight degrees. In a few minutes the young gentleman complained of a smarting on the surface of his thighs, legs, and back. His skin at different places assumed a red colour, and from one place some blood was discharged. The bath having been so strongly impregnated with so active an agent as the gall unquestionably is, caused me to feel somewhat uneasy for the subject of

this unpleasant experiment, and to prevent any injurious consequences from occurring to him, I cautioned him against continuing in the bath after being sensible of the least internal uneasiness from it. He was however not easily alarmed, and the desire he felt for the proper execution of the experiment induced him to persevere in the bath one hour and a half, the period which had been first fixed on. At the expiration of which time he rose out of it and after having very carefully washed away the matter of the bath which had settled on the end of the penis, he voided in a wine glass about two ounces of urine, in an hour more he discharged a similar quantity, and on the second hour, a portion of urine was also received. The four collections of this discharge—the one previous to going into the bath, and the three others after emerging from it, were placed side and side of each other on the table, and in respect to colour little or no difference could be perceived between them. In the next place the different collections of urine were divided, in order to subject a portion of each to the operation of each of the tests. The solution of soda, and that of the iron were poured into them without producing either a red colour, or a black precipitation.

The result of this experiment was considered very unfavourable to the supposition of the special agency of the astringent principle, on the absorbents of the surface. To be candid I must confess that previous to its performance the idea was entertained by me, with as it has turned out, too much confidence and partiality; but its fallacy has been fairly proved, and my obligations to just physiology have constrained me to relinquish it. Still being desirous to ascertain what constituent part of rhubarb and madder does pass through the skin, for I am certainly of the opinion it must be some particular part and not their substance generally, I again re-

volved in my mind their difference of composition from turmeric and many other articles which are not imbibed. The inquisitive state of my mind at the time soon discovered another essential difference of component parts which would require a few experiments to be properly investigated. Rhubarb and madder contain a quantity of that principle called by chemists *tannin*, which turmeric, asparagus, musk, &c. do not. It occurred to me that this tannin principle might, by its remarkable affinity for the matter of skin, as is manifested in the common process of tanning of hides, be forced with some of the articles attached to it, through the epidermis, so as to come within the reach of the subcuticular absorbents. Bathing in a decoction of either of those articles, first deprived of their tannin would supply us with a conclusive trial of the conjecture; I accordingly proceeded on this plan. The disposition of gelatin to combine with the tannin of substances, enabled me to have recourse to a very handy agent to execute the proposed separation, one pound of madder, and one quarter of a pound of glue, were boiled two hours in three gallons of water; after this part of the process was finished, eight gallons of common water were poured into the decoction, and the whole for fourteen hours was left to settle, at the expiration of which time the supernatant liquid was very carefully poured into the bathing tub containing twenty-six gallons of pump water. R. E. having voided in a wine glass some urine, removed his clothes, and immersed his body in the bath. The temperature of the air in the room was eighty-five degrees, and that of the bath at different examinations with the thermometer, was found to be seventy-five, eighty-five and ninety degrees. Frictions with the hand on the skin were frequently used. The bathing was discontinued in one hour and a half, after which, when the usual washing of

the genitals was done, the subject of the experiment discharged in a wine glass two ounces of pale urine. At each of the two succeeding hours, portions of urine were also collected in different glasses. These glasses were in the next place, arranged side of each other on the table, when it appeared that the urine collected before going into the bath was of a strong yellow colour, that discharged immediately after emerging from it was quite pale, the third was slightly yellow, and the fourth was of a deep yellow. To portions of each collection of the urine some of the solution of soda was added, which produced no effect on the first, but the second changed to a feeble red, and the third and fourth instantly assumed a bright red colour. The sulphat of iron however was added to similar portions of the urine without producing any precipitation, or any effect different from what it produces on common urine.

This experiment was conducted with great care; therefore, with confidence, I can pronounce it very conclusive against the supposition of a particular agency of tannin on the surface of the living body. It may be proper to mention, that its result is also strongly opposed to a former idea, that the passage of madder and rhubarb through the surface, is promoted by the stimulus of their astringency on the mouths of the cuticular lymphatics; for on examination, it appeared that the gelatin, or the glue had precipitated, not only the tannin but the gallic acid of the madder: for when an equal quantity of the iron solution was poured first into two ounces of the common decoction of madder, and then into two ounces of the bath, a deep black colour occurred in the former; but no change was perceived to take place in the latter.

Perceiving the facility with which madder passes through the skin, it occurred to me that by intimately mixing it with other articles, it might prove instrumental to their passage also. Under this supposition, I united in the bathing tub thirty-two gallons of a strong decoction of madder, to three gallons of a decoction of fresh asparagus; the latter decoction was made by boiling four or five gallons of the decoction of madder, on seven pounds and a half of recent asparagus. The nauseous smell which asparagus produces in the urine, and which will be attended to, as an indication of the absorption of the article into the system, is too well known to require a particular description. R. E. having voided an ounce of urine in a wine glass, stripped off his clothes, and immersed his body in the bath up to his chin; the heat of the bath varied, during the course of the immersion, from the ninety-fifth to the eighty-ninth degree of Fahrenheit; the temperature of the air in the room, was seventy-five degrees; R. E. continued in the bath two hours, and on rising from it with the precautions before stated, he discharged two ounces of urine in a glass. At each of the two succeeding hours, similar quantities of urine were also voided; the colour of the different collections of urine, consisted of a successively increasing tinge of yellow, from that voided before going into the bath, to the last discharged, after emerging from it.

The sulphat of iron poured into portions of them all, produced no change of colour; but when the alkaline solution was added to other portions of them, a red colour was developed in all three of the different quantities of urine discharged, after coming out of the bath. Every time after receiving the urine, its odour and appearance were particularly attended to, with the view to ascertain whether the asparagus had been imbibed with the madder; the nauseous

smell, however, which was to serve, as the indication could not in any instance be perceived.

One pound of the coarsely powdered root of rhubarb was boiled two hours in three gallons of common water, and the decoction was intimately mixed in the bathing tub with thirty gallons of water from the same pump. R. E. having voided in a glass two ounces of urine, stripped off his clothes, and stepped into the bath, whose temperature at the time, was ninety degrees. His nostrils had been previously closed with lint, and by embracing them very closely with adhesive plaster; they were rendered so completely impervious, that on several attempts he found it impossible to inhale through them; after being immersed in the bath, a long tin tube was handed to him, one end of which was taken into his mouth, and the other placed through an aperture in the window; the end of the tube taken into the mouth, was passed through the centre of a handkerchief, which were bound together about six inches from the part taken into the mouth by a ligature; compresses of linen were also sewed to the handkerchief, extending each way from the tube, so as to apply over the corners of the mouth; the handkerchief was in the next place thrown over his head, and fastened closely around the neck, which formed an additional enclosure of the mouth and nostrils. R. E. thus circumstanced, found that it was entirely impracticable to breathe through any other part than through the tube. Four pounds of spirits of turpentine were then, for the first time, brought into the room, and poured into the bath. The decoction of rhubarb and the turpentine were intimately mixed; the immersion was continued full half an hour before the subject of the experiment made any complaints, when such a degree of smarting suddenly came on, particularly in the axillæ, the groins, and on

the thighs, as to render a further continuance in the bath impossible. Indeed, before I was properly aware of the state the young man was in, such a degree of rubescence or irritation had occurred on the surface as to alarm me considerably; from his back downwards, his whole body was of a scarlet colour, and the pain he felt, was so acute, as to cause him to cry out. On the occurrence of these symptoms, he rose from the bath, held his breath, and ran into another room where he again breathed through a tube which had previously been fixed through the window for that purpose. He continued to breath the unadulterated air of the atmosphere while I sedulously washed the bath from his skin with soap and water. After having completely washed away the rhubarb and turpentine, he again held his breath and precipitately retired to another apartment, in the upper story of the house, where the adhesive plaster, and the lint were for the first time removed from his nostrils. In this room he dressed himself, and declared he had not at any stage of the experiment been sensible of the smell of the turpentine. In half an hour, and on the third and fourth of the succeeding hours after coming out of the bath, urine was received in different wine glasses, which collections were severally inspected by different persons, who all declared that the violet smell could not be perceived. When the alkali was added to them no effect was produced on the first and second, but the third and fourth instantly assumed a red colour.

One pound and a quarter of cabbage of a deep blue colour were gently boiled in two gallons of water during two hours, the decoction was then poured into the bathing tub, containing twenty-eight gallons of water. R. E. having voided two ounces of urine in a wine glass, removed his clothes, and sunk himself down in the bath up to his chin. The tempera-

ture of the bath at different periods of the immersion was eighty-five, eighty-seven, ninety, and eighty-nine degrees. The mercury of the thermometer hanging in the room, stood at the eightieth degree. Friction was very freely used during the immersion particularly on the inside of the thighs, and on the groins. The bathing was continued two hours, after which on rising, and after washing the genitals with clean water, two ounces of pale urine were received in a wine glass. A few minutes after replacing his clothes, three ounces of blood were taken from his arm, which was placed on the table and left to coagulate. On the second, and third hours after coming out of the bath, urine was also voided in separate glasses. The alkaline solution and a few drops of the sulphuric acid were added to different portions of the urine, and to the serum of the blood, without in any instance producing either a red or a green colour.

Thus gentlemen you perceive I have devoted some time and much unpleasant labour to the careful execution of a few important experiments on the interesting subject of the office of the skin, and though I have failed in my endeavours to ascertain why two articles are with readiness imbibed by it, and many others which have been used are apparently with equal certainty rejected, still I flatter myself what I have done, will not be without its use. After having repeatedly travelled over the ground of the subject, I have been constrained to retrace my steps even back to the place I first started from.

On account of the publicity which the experiments of a late graduate in this city have obtained, it has not been conceived necessary to state previously, that the present inquiry with

colouring matters was instigated by what that gentleman has done. For the same reason it is supposed that every one who has had an opportunity of reading Dr. Mussey's Thesis will immediately recognise my first experiment in substance, if not in the precise form, as a repetition of his. Though I am thus ready to give the fullest credit, and confirmation of the general results of his experiments, yet I cannot feel equally free in acceding to his conclusions. In my estimation, however plausible he may have rendered cuticular absorption, it cannot *necessarily follow* that such an office is performed by the skin, because madder passes into the system through it. Its passage by transudation on due examination, I believe will be found full as plausible if not more so than by absorption. I would not wish to be understood to have adopted this explanation altogether, but simply mean to convey that under the present state of our knowledge the experiments alluded to do not positively prove absorption; and I am willing to add that transudation requires much yet to be done in its behalf to establish it. The want of sensibility in the cuticle, many strong appearances of its inorganic nature, and I may add the total failure of the best anatomists in detecting any thing like vascularity in it, induce me to question whether *there are even absorbents on the surface, to absorb.* It may appear presuming in me; but I cannot avoid remarking, that it would be well if physiologists would practice more than they do the prudent rule, never to impute to an organ an office without having previously ascertained by injections, dissections or otherwise that the organ is competent to its performance by its anatomical structure. The celebrated Kirwan, in his Elements of Mineralogy, has a maxim to this effect " in our disputations on past facts, we ought without a single deviation, follow a certain principle of reasoning, otherwise we will certainly fall victims to the delusions of our own imagination. In the first place, let no cause be adduced

whose existence can neither be proved by actual experience, or approved testimony. In the second place let no effect be ascribed to any cause whose known powers are inadequate to its production." In consequence of a neglect of this rule, the late Mr. Cruikshank, many years ago fell into an error, by inferring the existence of absorbent vessels in the cuticle because mercurial ointment, rubbed on the skin produces the same effects on the mouth and throat, which mercury is known to do when taken into the system by the stomach. "That mercury is absorbed by the skin, cannot be doubted, for when rubbed on the skin, it produces a brassy taste in the mouth, stimulates the salivary glands, the intestines, and sometimes all the glands of the body, and produces all other appearances which it does when taken into the stomach." The same thing, he says, "is true of many other medicines. It is therefore evident that lymphatics arise from the skin." This was certainly undertaking to determine a most critical and important anatomical question by *appearances*, which subsequent inquiries have proved highly equivocal, if not even authorising a deduction opposite to the one he has made. In 1809, Dr. Mussey appears to have in some degree followed the example of Mr. Cruikshank, in inferring without any hesitation, cuticular absorption, because madder passes into the system when applied to the skin; as was the case with Mr. Cruikshank, concerning the mercurial ointment, he appears to have thought of no other conveyance for madder through the skin, the possibility of its having passed through the rectum and penis, has been overlooked, and perhaps the ingenuity and industry of some future inquirer, may yet ascertain that what he has discovered, is as far from proving absorption from the surface of the cuticle, as the reasoning of Cruikshank. Thus much however I will say, if such an office does really exist, its establishment requires

reasoning more direct, and conclusive, than what the assertions and experiments of Cruikshank and Mussey can warrant. The admission of absorption, after the filtration of madder and rhubarb, through the cuticle so as to come within the grasp of the subcuticular lymphatics, may be conceived a concession on the part of those who have opposed absorption from the surface, but without any just cause, because if gentlemen will take the trouble of looking into authorities on the subject, they will find that it has been absorption from the surface *only*, *and not from the skin or the cutis vera* which Seguin, Currie and Priestly, have in my estimation very justly, and very honourably to themselves, opposed. Wherever such vessels as absorbents are, there it is highly presumable, nay I am willing to grant, absorption under some circumstances either of health, or disease does actually take place, and it need scarcely be observed that the converse of this must be equally correct in the disproof of such an office.

The absorbent vessels are supposed to take their beginning from the skin analogous to their origin on the surface of the intestines. Their orifices or mouths have been demonstrated by Mr. Cruikshank, on the villi of the intestines, and the same ingenious anatomist seems to think, they originate in the same manner on the villi of the cutis. The opinion however has never been proved though a very plausible reason is assigned why it has not been; owing Mr. Cruikshank supposes, to the vessels of the cutis vera, not forming that abundance or largeness of villi, which those on the surface of the intestines do: means which were completely successful in demonstrating the absorbents in the latter case were ineffectual in the former. To conclude then on this point, the extent or present state of our anatomical knowledge renders it probable that lymphatic absorbents do arise from the surface

of the cutis vera, and particularly from the villi ; but exterior to these places of their reputed origin, I know of no facts collected from either the healthy or diseased state of the surface which prove, or even make it plausible, that absorbents do originate or exist. Hence the doctrine of *cuticular absorption* appears at variance with anatomy, for where there are no absorbents surely no lymphatic absorption can take place. However, be the fact as it may, whether absorbents in the cuticle or not, I think every one will admit that the particular attention which cuticular absorption, and indeed we may say lymphatic absorption generally, has received in our university, redounds greatly to the credit of the School. Within the last few years, I know of no other medical seminary where the inquiry has been pursued with greater or even equal assiduity. It is true the labours of our physiologists have resulted, more than could have been wished in opposite opinions, and conflicting experiments. But candidly considered I think even this circumstance should not give rise to reflection, on those gentlemen whose opinions and experiments have already been given to the world. The same thing is perhaps almost unavoidably incident to every new, or difficult physiological pursuit, and though readers have been, and, may hereafter be at a loss, what to conclude from such a series of discordant knowledge, yet I shall confidently look forward for the occurrence of a time not far distant, when even these contending opinions, and experiments, will largely contribute to the establishment of the real, and true office of the skin. Such a discovery will constitute an era of no small importance in medical history, and I flatter myself, from the zeal with which many of our experimentalists appear to be penetrated, that the honour of such an acquisition to science, is reserved for some one of the American faculty.

Result of Experiments on Cuticular Absorption, by DRS. SMITH *and* ROUSSEAU. *In a Letter addressed to the Dean and Medical Faculty, of the University of Pennsylvania.*

Philadelphia, December 20th, 1809.

GENTLEMEN,

Presenting you with the general result of our experiments on cutaneous absorption, we feel the necessity of offering an apology for the lapse of time since the date of our first communication.

We hope it will only be necessary, to call your attention to the difficulty of collecting together professional men, as often and as long times as a series of experiments replete with difficulty demand. This want of time is the reason which prevented Dr. Klapp from prosecuting the experiments with us, hence his signature is wanting to this communication.

Would that our inquiries had been brought to a conclusion, or been more satisfactory. We give you all that has been decisive in our experiments.

1. Rhubarb and madder *communicate* their colouring matters to the urine of those, who have *certain* parts of their bodies immersed in warm decoctions of those substances.

2. No other substances do from our experiments.

3. Neither madder nor rhubarb, colour the urine of a claret red, *until* alkaline solutions are added.

4. All tests except alkalies are fallacious, and indeed useless.

5. The thighs, from half way above the knees, the groins, the buttocks and inside of the arms, are the only parts of the body which seem to admit the colouring matters of rhubarb and madder.

6. In one experiment we neutralized the gallic acid of rhubarb, by means of iron, and the bath had no effect on the urine; we do not consider this decided yet as a principle; other experiments must determine it.

7. Madder and rhubarb when taken by the mouth, always colour the serum of the blood a claret red; yet no change is perceptible in the serum of a person who has bathed in decoctions of those articles, notwithstanding the urine of the same person is changed, on the addition of the alkalis.

8. No astringents, colouring substances, nor any of the most powerful narcotics, have the slightest perceptible effects on the system, if the nostrils be stopped.

9. Very large soft poultices of finely powdered rhubarb, applied to parts of the body which favour the admission of the colouring principle of both rhubarb and madder, produce no effect; although they die the skin of a brilliant yellow, and remained applied for fourteen hours!

10. If the bath be considered cool, as it regards the temperature of the body, (say seventy degrees), no effects are produced.

11. The objections of those who doubt absorption, are reasonable; because—1, the substances employed by them and others, possessed no sensible effect on the system; 2, or the surfaces experimented on were too limited; or 3, the surfaces possessed no power to receive them; as our statement declares the admission of two and only two *inert*, colouring matters seems to be very partial.

12. We beg leave to remind you, that several articles soluble in water, remain indelibly fixed for life, even when applied to the absorbents themselves; as the figures on sailors bodies!

With respect and esteem,

Gentlemen,

your humble servants,

H. ROUSSEAU, M. D.

SAMUEL B. SMITH, M. D.

Observations on Pertussis. *By* DR. RICHARD HAZELTINE.

Berwick, Maine, November 23d, 1809.

SIR,

According to my promise, made some time since; I forward the following observations on Pertussis, for your examination, and for insertion in your valuable Museum, if you should judge them worthy of so honourable a destiny: if not, I would only request that you would be so kind as to return them again to me in the mail. Should you think proper to publish them, you may add my name to the title, if you please, or withhold it.

I am, &c.

RICHARD HAZELTINE.

DR. JOHN R. COXE.

OBSERVATIONS ON PERTUSSIS.

Pertussis is a disease, of which the nature is so imperfectly understood, and the circumstances frequently so distressing; that it is believed even a hint calculated to elucidate the former, and alleviate the latter, will be well received.

I would not willingly incur the charge of presumption, in attempting to offer any thing on a subject, the nature of which seems at present so obscure; especially, as I am not confident that I am able to contribute even the *poor widow's mite* towards the development of it; but I conceive it to be a duty incumbent on every one, to lend a helping hand on any occa-

sion which affords an opportunity, to pluck an arrow from the quiver of the king of terrors.

The observations which constitute the substance of this paper, were chiefly made while the hooping-cough prevailed epidemically in this town (Berwick) and neighbourhood, during the year 1808. The disease first appeared, as far as I know, in the month of March, in the town of York, which lies south-east of this, and thence spread into this town. The first patients to whom I was called were attacked in the month of May. The disease continued to spread, though very tardily, through the succeeding summer, autumn, and every season of this year, 1809, even to the present time, November; but was most prevalent in the month of August, of the last year.

It would be, perhaps, impossible to add any thing important to the inimitable description of this disease given by the late Dr. Cullen in his First Lines of the Practice of Physic; but, in my opinion (with due deference, however, to medical authority for which I entertain the most profound respect saying, "it has, in common with the catarrhal contagion and with that of the measles, a peculiar determination to the lungs," does by no means point with sufficient precision, to the seat, or to the proximate cause, of the disease. He must, indeed, be a superficial observer of the phenomena of pertussis, who does not discern something in the concourse of them, more than a simple affection of the pulmonary system, and the ordinary concomitants of such affection. Nor is that theory which supposes the disease to be "wholly dependent on the affections of the stomach, and to have for its proximate cause, morbid irritability, chiefly of that organ, with increased action of its mucous glands," more

satifactory to me: neither do I believe the disease to consist "in an inflammation (at least not primarily) of the membrane which lines the air-vessels of the lungs;" nor that its long duration is to be attributed to this inflammation continuing to creep successively over every portion of that membrane; according to the opinion of a late ingenious pathologist. I cannot easily conceive that an organ of such delicate structure and functions as the lungs, can be affected with any considerable degree of inflammation, either at once, or successively in its several parts, and the patient at the same time be disposed to eat, drink, sleep, and play, with as keen a relish as in perfect health, the temporary interruptions arising from occasional paroxysms of coughing excepted.

Whenever I knew the hooping-cough to prevail as an epidemic, previous to the last year, I attended to its circumstances as a physician merely; but during its prevalence last year, I was interested as a parent as well as a physician. From its occurence in my own family, I was led to watch its phenomena, with acute attention and great care. And after having maturely considered all that has occurred to me from reading and observation, concerning the disease; I am inclined to espouse the opinion of the celebrated John Hunter, that the *throat* (I would say the *larynx:* perhaps the *epiglottis*) is the seat of the disease. I am further of the opinion that the coughing, and the vomiting which so frequently accompanies it, are sympathetic; and that most of the other phenomena, are owing merely to the mechanical agitation of coughing, and are therefore, also sympathetic.

It must be confessed that it is not yet known, what is the nature of the hooping-cough contagion, nor precisely on what part it fixes, nor in what manner it particularly operates; but

I think it is evident that it produces an increased sensibility of the larynx and contiguous parts, and probably some degree of inflammation there; for in most cases of the disease to which I have attended, I have observed in the mucus thrown up by coughing, a small portion of matter which appeared white, thick, and opaque, more like pus than any thing else; but in so small a quantity that it must have been detached from a very small superficies. Let any one attend minutely to the circumstances of a paroxysm of coughing in this disease, and I presume he will become irresistibly impressed with a conviction, that the efforts are not simply such as ordinarily effect the expectoration of pus or mucus, from the *vesiculæ pulmonales* and *bronchæ*; but such as are suited, with an inverted action of the œsophagus and stomach, to dislodge something that irritates the exquisitely delicate and sensible membrane, which lines the larynx and contiguous parts.

It has been justly observed that the "patient has commonly some warning of" the approaching paroxysm: at such times, I have questioned those patients who were capable of giving me a discreet answer, where they felt the uneasy sensation? and they have generally pointed to the larynx.

The frequent failure of the best devised methods of treating the hooping-cough, is evidence to me that some of its most distressing symptoms and those which more especially call for medical aid, are merely sympathetic; and that the prescriptions of physicians have been generally adapted rather to palliate those sympathetic affections, than to remove the proximate cause of the disease. Some have advanced an opinion, as adverted to above, that the stomach is the seat of the disease. Practical writers say there is a cough, and such

there undoubtedly is, that is owing to an unhealthy condition of the stomach: but is the *tussis stomachalis* ever known to be that violent convulsive cough which is characteristic of pertussis? I presume it is not. Besides, who ever knew the functions of the stomach in the *tussis stomachalis* so little impaired as they are in pertussis? in the latter disease the appetite for food is often not only unimpaired, but is sometimes "craving," and that, even immediately after the contents of the stomach have been thrown up by vomiting, caused by a paroxysm of coughing.

If the lungs be the seat of the disease, as some suppose, I would ask, what can be the morbid condition of them? since not much else than the natural mucus which lubricates the respiratory organs, and that in a state, at least, not very unhealthy in appearance, is expectorated. And, if the hooping-cough be an idiopathic disease of the lungs; why is the action of *vomiting* so frequently associated with it, and not with other pulmonary affections? and further, as the hooping-cough *commonly* occurs, judging of its *force*, by the pulmonary symptoms merely, and comparing *it* with *that* of other forms of pulmonary disease unaccompanied with organic lesion, I would ask, what physician cannot treat any form of the latter, with more certain success than he treats the former?

Were I to offer a conjecture respecting the pathology of pertussis, it would be as follows: contagion of a specific kind fixes itself on the epiglottis or parts contiguous, and there, probably, produces some degree of inflammation: and such is at the same time, the connexion between these and the neighbouring parts, that a morbid sensibility is induced in the

organs of respiration, (at least in those immediately concerned in that function), and superior part of the alimentary canal; in consequence of which, convulsive coughing and spontaneous vomiting are sympathetically excited, and recur at uncertain intervals, in order to dislodge the offending cause; and so powerful are those efforts in most cases, and such is the nature of the local inflammation, as to excite the arterial system and other parts of the animal economy into sympathetic action, and thereby produce all the other phenomena which accompany the disease.

Should an objector ask, what peculiarity in the structure and organization of the epiglottis and contiguous parts can invite the contagion of hooping-cough to fix itself there rather than any where else in those important avenues to the lungs and stomach? I acknowledge I know of none: and would take the freedom to reciprocate the question, with a little variation, however; and ask, what peculiarity in the structure and organization of the *throat* can invite the virus of the *rabies canina* to display its wonderful power so conspicuously *there*, rather than any where else in the avenues just mentioned? Many such questions might be asked, which, in the present state of medical science, it is believed would be difficult, satisfactorily to answer; but I forbear: And lest it should be thought that these observations savour two much of conjecture; I would only remark, that it is lawful to conjecture on a subject which I conceive to be so imperfectly understood, as the seat and proximate cause of pertussis.

The contagion of pertussis seems to be weak, if we judge from the tardiness of its progress through a village or town; and from the frequent instances which we meet with, of per-

sons who never had the disease. I am acquainted with a family of several children, now mostly adults, who have lived in Boston several years, but mostly in this town, and have frequently been exposed to the contagion of pertussis, in town and country, without taking the disease. It may be worth remarking, that most persons, male and female, of this family, have been to sea, some of them more than once, and not one of them was ever sea-sick.

As far as I know from what I saw, and from information, the disease was generally without much fever during its prevalence last year; and for the most part its symptoms were moderate. A few cases were violent. I was called to one patient in whom the disease was accompanied with convulsions and worms, and what share the latter had in producing the convulsions, I could not say: but three other children in the same family laboured under the disease at the same time, and one or two of them with worms also; but without convulsions. The paroxysms of coughing were frequently productive of a discharge of blood from the nose, and a vomiting of the contents of the stomach. I saw one case in which the *tunica conjunctiva* of both eyes was totally suffused with blood, so that not a trace of the beautiful pearly whiteness of the healthy eye, was to be discerned. I heard of two cases in which the disease proved fatal by inducing what is called a *hernia cerebri*, in one; and a *phrenicula* in the other. I was informed of some other cases that terminated fatally; but I did not learn in what way.

It was a prevailing opinion in Berwick that medicine was of no avail in the hooping-cough; and I was informed that some of the faculty countenanced that opinion by their declarations, and by their inattention to the disease: of course,

physicians were not much consulted with respect to a proper method of treating it.

An attentive observer of the phenomena of pertussis, will generally perceive that two successive stages pretty distinctly characterize its progress. In the first, besides the paroxysms of coughing and other attendant symptoms, we observe a predisposition to, or more or less of fever, generally of the inflammatory type, and attended with the usual diagnostics: in the second, the fever shall have wholly subsided or become sensitive (hectical) * and some degree of debility shall have taken place; the paroxysms of coughing continuing; but evidently more from habit, than from the continued influence of the contagion. Perhaps it is owing to the different effects which the same medicines are liable to produce in the different stages of this disease, that the prescriptions of physicians and their reports of the efficacy of medicine in treating it, are so different: for the same medicines which may be useful in one stage, may be injurious in the other. And as the disease, if judiciously treated in its first stage, is not likely to require much or any attention in the second ;† so we see the prescriptions of some writers, best adapted to the former. On the contrary if the disease be neglected or improperly treated in the first stage, the second will require special attention, and demand the use of medicines very different from those which are proper in the former or inflammatory stage: hence, we find, in medical books, certain articles of medicine

* I entertain some suspicion, as will appear from the pathology of the disease which I have given, that the fever, in both stages, is sensitive, or hectical.

† Indeed if the disease be properly treated in its *first* stage, a *second* will be perceived but in very few cases.

highly commended in the treatment of this disease, which are suitable only in its second stage.

I have known the hooping-cough to prevail as an epidemic several times previous to the year 1808, and in places, too, where people were not so distrustful of the powers of medicine in the treatment of it, as they were in this town during the period to which these observations particularly relate, and of course, were more ready to consult a physician: so that in what follows, I speak from experience.

Whenever I have been consulted in this disease, my prescriptions have constantly had reference to the two stages above mentioned. In the first, I employed such medicines as were suited to destroy the force of the contagion; to cleanse the alimentary canal; to promote expectoration; and to obviate fever.

1st. *To destroy the force of the contagion.* For this purpose I believe there is nothing to be compared to an alkaline salt. The form which I employed was,

℞. Impure carbonate of potass, i. e. pearl ashes, ʒ i.
Common water . . . ℥ viii.

for a solution. Of this I directed from one or two tea-spoonfuls to a table-spoonful, sweetened with molasses, to be given three times in a day, to a child from one to eight or nine years of age, fasting. Of this simple medicine I entertain a very favourable opinion; and I believe if it be employed early and constantly, and a proper diet and regimen be observed at the same time; little or nothing else will be necessary through the whole course of the disease: and that the latter will terminate in half the time it would take up in its

progress, if neglected, or treated in any manner without the alkaline salt. This opinion is not chimerical, but founded on what I have witnessed of the utility of the medicine, in all cases where I have known it fairly tried. Those who are fond of more pharmaceutical formality, or whose patients fancy a virtue resides in the *colour* of a medicine, may add a little of the *tinctura ligni pterocarpi santalini*, or *cocci cacti;* or they would, perhaps, prefer the recipe "of the bold, dogmatic, and eccentric Marryat," as he has been called, which is as follows:

℞ "Prepared kali, two scruples,
Peppermint water, an ounce and a half,
Balsamic syrup, half an ounce,
a tea or pap-spoonful to be taken night and morning."*

2dly. *To cleanse the alimentary canal.* For this purpose I have generally found one or two emetics, and perhaps, as many eccoprotic portions necessary. In cases where the stomach was much oppressed, the fever considerable, and the cough dry, hard, and unproductive; I gave a gentle emetic, two or three times in the course of the disease with evident advantage, especially, if it were exhibited towards evening. Calomel commonly constituted a part of both my emetics and purgatives: ipecac was the basis of the former, and rheubarb of the latter, in most cases. To provoke gentle vomiting and purging in young children, and at the same time, to promote expectoration, I have often found nothing better in this disease, and in many other pulmonary complaints of childhood, than a mixture of urine and molasses.†

*The Art of Healing, 13th, edition, p. 254.

† This appears a very singular prescription, if the word is not mistaken. We should have been glad to have had the exact formulæ.....*E.*

3dly. *To promote expectoration.* For this purpose I employed antimonial wine in small doses several times in a day; also, gum ammoniac dissolved in hot water; acetum scilliticum; glycerrhiza; a tea of flaxseed and hyssop; and recommended a liberal use of honey, brown sugar and molasses. In cases of but little fever, or when this began to decline, I gave tinct. op. camph. or the thebaic tincture and antimonial wine, in equal parts, at bed-time, with great advantage.

4thly. *To obviate fever.* For this purpose I depended on the emetics, eccoprotics, antimonial wine, blisters, &c.

In the second stage of the disease, two indications may require attention: 1st, to obviate debility: 2d, To remove the habit of coughing. But, not to be too particular, my remarks will be few, and relate to the accomplishment of both indications at once. And notwithstanding the variety of means suggested and recommended by practical writers for curing this disease in its second stage; I have seldom found any thing necessary besides the tinct. theb. and antimonial wine, equal parts, taken several times in a day, (i. e. three or four), and paying proper attention to regimen and diet, at the same time. But in cases of considerable debility, Ihave used the following, with the most pleasing effects:

℞ Decoct. cort. peruv. ℥ vi.
Tinct. op. camph. ʒ vi.
Tinct. cantharid. ʒ i.

Misce; cujus sumat ægrotus ℥ ss. ter de die.* With the same intention, I have sometimes employed the quinquina, or the cascarilla, alone.

* London Practice of Physic: article Hooping-cough.

In both stages of the disease, I have directed raw onion, or bruised garlic, to be applied to the feet, at going to bed, with evident advantage; and if the head were much affected, I have ordered sinapisms to the same parts.

I am confident that subsisting on a light, abstemious diet, and avoiding exposure to the wet and cold, are practices of the first importance in both stages of this disease; and if rigidly persevered in, will render it both milder in its progress, and of shorter duration.

In cases of considerable pneumonic affection, I have applied adhesive or blistering plasters to the breasts, sides, or back; according to circumstances: and I have seen some feeble children who have complained of great weakness in the epigastric region, and that it distressed them there when they coughed, who have been greatly relieved by a strengthening plaster applied to the part.

It is not to be doubted that blood-letting would be advantageous in some cases of this disease; but I have not practised it in any instance that I recollect, except in adults.

In a few cases I employed the acetite of lead, five grains, dissolved in aqua rosarum, two ounces; a tea-spoonful, fasting, three times a day; but with no particular benefit that I could perceive.

In my inquiries among the people concerning their remedies in this disease, I was assured by several persons that they had found nothing so useful as indulging their children in the plentiful use of sugar and molasses. I was also informed by a very respectable lady of the society of Friends,

and one of no inconsiderable acquaintance with the diseases of children, and by no means subjected to the vagaries of fancy, that she had repeatedly experienced the most happy effects in the hooping-cough, in her children, from the use of a powder made out of a certain little animal, roasted whole, so long and so moderately by the fire as to become *charred*, dry, and pulverizable, and taken three times a day in molasses, in the dose of a tea-spoonful.*

I have heard an infusion of raw onion in hot water, and sweetened with honey, highly commended in this disease; but have had no experience of its use.

It is not uncommon for this disease, if left to itself, or improperly treated, to harrass the afflicted little patient, at least three months; but if treated in the manner above detailed, I believe it will not continue more than six or eight weeks.

To conclude: judging from what I have observed of the effects of medicines in this disease, after having seen it prevail several times as an epidemic since my acquaintance with medicine; I feel myself warranted to assert, with an excellent living writer on the diseases of children, in his observations on it, that, "there is no complaint of children with which I am at all acquainted, in which medicine is at times more evidently serviceable, than in a bad hooping-cough."

* I would not answer for the readers gravity, were I to *name* this animal; and therefore will keep the secret to myself.

Cases of Nasal Polypus, Cured by Fumigation with the Red Corn Cobb, in a Letter from DR. BAKER *of North Carolina, to* MR. BURGES, *Student of Medicine.*

"Mrs. W..... had for some time experienced much difficulty in breathing through her nose, and on examination a large polypus of a dark purple colour was discovered, which was painful: no attempt however was made to extract it at that time, as she was then suffering very severely from a paralytic affection of the muscles on one side of the face and head; and indeed some doubt existed as to the propriety of intermeddling with a polypus of that description. In consequence of the delay, she had recourse to a remedy recommended by an old woman of the neighbourhood, which had the desired success. It was fumigation with red corn cobs: this was affected by beating the cob into a coarse powder, which was put into a common tobacco pipe, the stem of which was inserted in the nostril, whilst an assistant blowed on the burning cob in the bowl of the pipe. This was repeated several times in the day. The other case was, the negro woman belonging to Mr. Devereux whom you saw: the nostril you recollect, had been so much contracted by the foolish application of caustic, that extraction was impossible, the fumigation was consequently recommended, and has had the desired effect. Whether there is a difference between the red or white cob I am not able to say, nor is it material as the red is in great plenty. Dr. Coxe may publish it in his Museum, if he thinks proper."

Observations on Empiricism. *By* WILLIAM G. REYNOLDS.

Monmouth County, N. J. Feb. 21st, 1810.

RESPECTED SIR,

THE inclosed observations I offer you for publication; should they meet your approbation sufficiently, to entitle them to a place in the Museum, the first part of my end will be obtained. Their publicity may possibly excite more leisure or able pens, to farther comment on the same subject; and thus gradually lead to the subduction of an evil, hitherto too prevalent and too little noticed in the medical world. Should this be in any degree the happy consequence, the object of my remarks thus loosely and hastily thrown together, will be fully accomplished; and should it not, I will nevertheless continue to feel the testimony of a good conscience in favour of the uprightness of the motives through which they are offered.

I am Sir, respectfully, yours, &c.

WILLIAM G. REYNOLDS.

DR. J. R. COXE.

Remarks on Empiricism.

Among the many appreciable objects of the Medical Museum, I observe by the perusal of its contents, that the evils of quackery have not been overlooked; several useful observations on this subject, being interspersed through the body of that valuable work. Whilst I express satisfaction as to the justness of these observations, and the zeal of their authors, I cannot but regret how far they must fall short of their intended end.

It is but rarely that the Museum, or similar works, meet the eye of an individual of that class of society, who become the immediate or most common subjects of quackery; and even when to this deluded part of mankind, the language of reason and good sense is offered by a physician, total inattention, and often suspicion of selfishness or interest on his part, is the reward of his kind intentions. 'Tis true, that numbers of individuals are daily by fell experience, convinced of the inefficacy of quackery to relieve their maladies; but this conviction often arrives at too late an hour to allow them to extend its advantages to their fellows; and surviving friends are often blinded by that fatal dogma of the vulgar, viz. "Their time was come" and "the doctor cannot save life." In short though the acquisition to the happiness of society, by the expulsion of quackery, and the observance of honour, candour, and honesty, in every pretender to the healing art, would be incalculably great; yet these are objects at too immense a distance for us to expect their speedy arrival. The former depending on the adoption of *judicious and energetic laws*, and the latter, upon what is equally foreign to a majority of mankind, viz. a propensity to be virtually influenced by rules of conscience, proceeding from just conceptions of religion and of moral virtue.

But at the same time that the philanthropic and good physician, mentally weeps over the many irremediable evils that befal society by the unprincipled practices of quackery, he is not to forget, that there are evils of a similar tendency though less in magnitude, against which, he may exert his efforts with a better prospect of success. Many ill-qualified, though *legal*, pretenders to the healing art, practice a kind of half-way juggling, between the most absurd empiricism, and correct medical principles; and as this is generally done

under the guise or shew of medical acquirements, its consequences extend to all grades of society, even to the most discerning and wise in some instances. To this class of practitioners I now take the liberty to offer a few remarks.

1. That no unqualified intruder into the profession of medicine, can be an honest man; for however scrupulously upright he may be in his pecuniary transactions with mankind, he is grossly deceiving them in respect to what is of much more value to them than wealth or fortune, viz. health and life. To say that a practitioner of this character is *a safe physician*, if he does no good, he will do no harm, because he will not proceed rashly, is reasoning very erroneously; loss of time by inert or nullified practice, is often a very serious and irremediable evil.

2. The practitioner who founds his claims to the healing art, either solely, or principally, on his own experience or observation, to the total rejection of the united experience of the medical world when in opposition to this, is by no means qualified for the exercise of the medical profession; an acquaintance with the history of diseases, and a due proportion of practical knowledge that is grounded on well established theory, being indispensibly necessary to insure general success therein.

3. The physician can neither be a philanthropic, upright, or morally honest man, who is in the habit of magnifying simple or slight diseases into formidable ones, in the estimation of his patient: who accumulates unnecessary expenses thereto, in the treatment of incurable or imaginary evils; or, who would seize on the bed of the disconsolate widow, the plough or meagre ox of the labouring hind, or the working tools of

the mechanic, to remunerate professional services rendered their possessors.

4. The perusal of a few books on medicine, as Brown's Elements, Cullen's First Lines, &c.* cannot insure to the student, or practitioner, those talents which insure general success in the treatment of diseases. These (talents) independantly of mere medical knowledge, requiring a familiar acquaintance with the qualities, properties, and laws, of the various subjects of the animal, vegetable, and mineral kingdoms; their relation to, and reciprocal influence upon each other, and the modes of producing this influence. To which must be added various branches of collateral knowledge, and an acute, inquisitive, sound mind.

5. The practitioner who indulges in the vulgar pleasures or habits of horse-racing, cock-fighting, fox-hunting, habitual drinking or carousing, swearing, fighting, or such like immoral practices; not only incapacitates himself for the proper and respectable pursuit of his profession, but forfeits all just claims to the confidence of society, and to the character of a gentleman; a character to be manifested in every act and word of the physician.

6. The physician who neglects to employ a reasonable portion of his time in the attainment of useful knowledge, by reading and research, and to extend his inquiries to the progress that science is daily making around him, *is a non-entity*,

* This remark may be condemned by some gentlemen even of respectable talents, as most physicians have their favourite authors. But I will hazard the opinion, that whatever may be the merit of these books in the hands of well informed practitioners, they have in the hands of injudicious and ignorant ones *slain their thousands*.

and should be as promptly excluded from the practice of physic, as the clergyman would be from the exercise of clerical functions, who should atrociously violate every principle of christianity.

There is ample room for extending my remarks on this subject, but a fear of trespassing on the time or opinions of too many of my readers, induces me to close them for the present, with observing, that, neither a hoary head, a long succession of ineffective puny practice, nor a reputation gained by address or fortuitous circumstances, can afford a complete sanctuary from the above predications; all such characters should meet the discountenance, and disapprobation of all the respectable part of the faculty.

I will subjoin a few cases that have come within my immediate notice, as specimens of the medical talents of men who are honoured with the character and considerations due to physicians of the first standing, and are some of them actually believed to be such in their respective neighbourhoods.

1. The amputation of a leg at one and a half inches below the knee joint, and healing the stump over a piece of ligature, which was withdrawn many months after from a troublesome sinus.

2. The treatment of a carious tibia, by repeatedly boring into its body with common nail gimblets, and with these instruments, prying away the greatest part of that bone in dissevered fragments; leaving the sharp spiculæ at each extremity to the agency of lint wetted with ardent spirits.

3. The application of a solution of acetite of lead in ardent spirits, to a wounded and suppurating capsular ligament.

4. The alternate exhibition of pulv. cinchonæ, and nitrate of pot-ash, in appropriate doses at intervals of one and a half hours from each other, in cases of remitting inflammatory fever with quick hard pulse.

5. Closing the wound consequent to the reduction of strangulated hernia, with sutures, at three quarters of an inch from each other, and each perforating the peritoneum.

6. Dilating the os externum with both hands in an obstetric case, while the child's head was wedged in the inferior straight; in order as was said, "to give the child a little breath, until succeeding pains should propel it forward."

7. Mistaking a plain case of hydrocele of the tunica vaginalis testis for hernia,* and attempting to reduce it by the taxis, to the no small misery of the patient.

8. Attempting to cure scrophulous tumours by the knife, and actually extirpating them under the name of cancers.

9. Opening spina bifida, as though it were a common abcess, and even extirpating those tumours!

10. The application of bitter herbs and vinegar, to a fractured cranium, with advice at the same time to an affectionate father, not to send for any of the "cutting doctors" as they would only torture the patient to no purpose.†

* I am aware that it is in a few cases difficult to discriminate between these two complaints, but such cases cannot properly be called *plain*.

† To this patient I was called on the evening of the fourth day after the accident. The depression in the cranium was very plain to the touch. After

11. The application of acetous acid and muriate of soda, to gun-shot wounds, with an assurance when interrogated as to the efficacy of the medicine, that it was the very best thing that could be applied.

To these I might add a long list of prescriptions, such as the daily use of sow-bugs, for weeks, in the last stage of a consumption; the *real unicorn-horn powder* in the common diseases of children, and many other equally contemptible absurdities. But as these might appear in the opinion of some of the more forbearing part of the faculty, to denote ire or resentment against individuals, which I am very far from feeling, I will hasten from them to the conclusion of my observations.

In a subject so difficult and obscure as the animal economy, it is not surprising that the most able practitioner should be often embarrassed; and that, instead of certainty, he should be obliged to determine sometimes, his conduct by probability, or by loose and uncertain analogy. In such cases the errors of practitioners should be lightly and kindly treated by each other, seeing they are a natural consequence of the imperfect state of our knowledge of medicine. The more extensive this knowledge the more will we be inclined to abate our confidence; while impudence, dogmatism, and visionary speculation, are the genuine offspring of ignorance. These if

making three perforations with the trephine, I was enabled to raise the depressed portion with the elevator; one edge however of a fractured portion of bone, could not be raised to nearer its corresponding sound portion, than the seventh or eighth of an inch, and it was not thought advisable to make any farther use of the trephine, though stupor continued for twenty-four hours afterwards. Five days after the operation, this portion had completely recovered its natural place. Thus the efforts of the brain alone effected what the united strength of myself and an assistant could not do. The patient did well.

not opposed would in the end completely vandalize all science; hence, it becomes a task incumbent on the republic of medicine, to lop from its body, all those unnatural, fulsome, and useless excrescences, which have for ages so successfully opposed its climax in the great scale of human excellencies; and to receive from the hands of truth, science, and virtue, that just polish, that intrinsic gracefulness and merit, for which many of its members have laboured, and which afford the true testimonials, of the nobleness of its object, the benignity of its character, and the divinity of its origin.

The change of temperature experienced here on the 17th and 18th of January was as follows. 17th, 12 o'clock, Fahrenheit's thermometer stood at 42°; at five P. M. it stood at 40°; at twelve P. M. at 10°; whence it sunk to 6° on the 18th, and on the 19th to three above 0; where it remained till the 21st, on which day it began to rise. From the 15th inst. the weather has been as follows.

Day of Month	*Thermomc. Shade.*	*Sun.*	*Winds.*	*State of Weath.*	*Occasional Remarks.*
1810. Feb. 15	40		West	a little rain	The autumnal and winter diseases have been in general of an inflammatory remitting type. No new cases have come within my knowledge since the fifteenth instant.
16	38		W. by S.	clear	
17	37		S. E.	hail & rain	
10 A. M. 18	48		S. W.	opaque	
11 A. M. 19	55		S. W.	heavy clouds	
from 3 to 11 P. M.	58		strong S W.	with rain	
20	45		W. by N.	clear	
21	45 to 36		W. by N.	clear	This weather is such as we meet with from the middle to the end of April, under the tropic of cancer, and as fine as we expect here at the last of May.
22					
23	43		West		
24	40		W. by S.	fair & pleasant	
25	50		W. by S.	clear fine weather	
26	56		W. S. W.		
27	40		W. N. W.		

I have in this table marked the highest temperature; the thermometer has several times sunk to 32 during the night.

R.

Observations on the Hydrocele Capitis Infantum. *By* Dr. Elisha North.

Goshen, Litchfield County (Con.) Jan. 18th, 1810.

Sir,

I have the pleasure to communicate to you the discovery of a safe, easy, and effectual remedy for a hitherto incurable disease. It is a disease of infancy. It may be called *hydrocele capitis infantum*, or the watery tumour of the head of infants. It has been described in medical books under the name of spina bifida. It has been supposed the two diseases were similar in their nature; this supposition, for aught I know may be true. But as the remedy which I have found useful, has been applied to the tumour of the head only, I choose to give that a distinct name; for it may be found upon experiment, that the remedy may not prove equally efficacious, when applied to the tumour on the back; or it may appear when more shall be known respecting these tumours, that they are dissimilar in their nature. It seems, however, to be well ascertained, that these tumours, whether on the head or back, are alike, in two respects at least, viz. 1st, that they both prove equally mortal when left to themselves; 2nd, that when opened with the lancet they both commonly end in sudden death. Three instances have come within my knowledge where these tumours were opened by physicians, who were ignorant of their nature; two of these were upon the head, the other was on the back. Death was the immediate consequence in all.

Dr. Spence, in his Treatise on Midwifery, says, M. Acrel proposes pressure and astringent applications to the spina bifi-

da. He at the same time proposes to obviate the effects of what he supposed would be the consequence of this pressure, viz. pushing back the fluid upon the brain, by giving internal medicine, to produce an absorption of said fluid. In this manner he thinks the spina bifida may be cured. Yet he thinks pressure, when the fluid is in the head, would answer no good purpose. But Dr. Spence thinks no good would result from the practice in either case.

Mr. Benjamin Bell, in his System of Surgery, proposes to tie a ligature round the base of the tumour on the back, &c. Whether the experiment has ever been tried we are not yet informed: at least it has not come to my knowledge. Mr. Bell informs us gentle pressure is useful in spina bifida: but the manner, in which he speaks of it, is such, that we are not led to expect a permanent cure from it.

From all this, then, it appears that although pressure has been thought of, yet physicians have been hitherto deterred, in consequence of theoretical reasons, from thoroughly using it: especially in that species of the disease, which I have taken the liberty to call the hydrocele of the head.

I am now prepared to inform you that the remedy which is both safe, easy, and efficacious, in the cure of the hydrocele of the head of infants, is simply compression by means of sheet-lead, applied to the tumour and constantly continued, until a cure is effected; without at the same time, giving a particle of medicine of any kind.

Four infants have been thus cured. It may perhaps appear to some premature, thus to announce this remedy, when only four patients have been the subjects of the experiment. But

let it be considered that the space of fifteen or sixteen years has been necessary to obtain this number of patients, in the practice of one individual: especially country practice; and that many lives would be lost in a whole kingdom, before any individual could multiply a sufficient number of cases to ascertain whether the remedy will prove equally successful in all the varieties which may occur.

I have, therefore, to request the assistance of others, in ascertaining the power of the remedy in the various circumstances which may happen.

When the uniformity of nature's laws are contemplated, I cannot avoid having sanguine expectations, that the remedy will prove equally successful in the hands of others. Should others be induced to try the experiment, it is to be hoped, that they will be so kind as to give the public the result of such experiments.

I will now relate the practice which I have followed in detail. In these infants the cases were very similar. The only essential difference was the following. The third infant to whom I was called, I did not see until the child was three or four weeks old. The tumour had in this time increased very considerably in size, and had become very considerably larger than the un-ossified opening, which was through the parietal bone. I gave a guarded prognosis; applied the compression; and with pleasing success. The other three patients I saw soon after birth. In these the tumours were less. They were soft and fluctuating. There was no discoloration of the skin. *Their contents protruded through unnatural un-ossified openings in the skull.*

The manner in which the pressure has been used is the following. A piece of tea-chest lead, or a bullet hammered sufficiently thin, has been properly shaped to fit the tumour, and then sewed into a doubled cloth: this last has been sewed to the child's cap, and then applied to the tumour, so as to press gently, equally and constantly upon it. The whole is then secured by proper bandages. The nurses have been directed to see that the whole is constantly kept on, until the cure is completed.

The tumour diminishes gradually and the bone closes over. No symptoms of compressed brain, or other inconvenience has occurred. The length of time necessary to effect the cure must be various. In one case the tumour had disappeared in four weeks, although the opening in the skull was not yet completely closed.

I am, Sir, with much esteem,

Your humble servant,

ELISHA NORTH.

DR. JOHN REDMAN COXE.

Experiments and Observations on the Hop. *By* JAMES CUTBUSH *of Philadelphia.*

A medical gentleman of this city some time since, requested me to prepare an extract of hop by two modes. The first by the use of water, by which the gummy part might be obtained, and the second by the use of alcohol with a view to procure the resin. The gummy matter, however, may be considered as partaking more or less of resin.* The object contemplated in making these two preparations, was to determine whether the virtue of the hop resided in the one or the other principle; but I have not heard particularly of the success which attended their exhibition.

The process employed in both experiments, was nearly the same, with the exception of water in the one, and alcohol in the other, which was of the usual specific gravity. A given quantity of hop was digested with the assistance of heat, and the decoction, when filtered, was evaporated. The *watery extract* was considerably more than the alcoholic; the former amounted to about .50 and the latter to .30; the loss (.20) was the essential oil, aroma, and probably some other volatile matter.†

* Gum-resins along with resin, are combined more or less with extractive matter.

† Independant of the pulp.

Mr. Clemens of this city made an experiment on a larger scale with the hop; he informed me, that he not only obtained a quantity of extract, but that, by distillation, he procured some ounces of the essential oil. He charged a still with sixteen pounds of hop and eighteen gallons of water; when twelve gallons were drawn off (which contained the aroma and essential oil), the residue he collected, and separated the pulp; on evaporation the liquor afforded three gallons of extract.

It is extremely difficult to determine precisely with respect to the bitter principle. Though it appears, that the gummy as well as the resinous portion of the hop, partakes more or less of the bitter principle, yet from some experiments which I have made, they would lead to the inference that they are both in some degree composed of it. The fact, however, has appeared to Mr. C. that the watery extract, was not only composed of the gummy matter, but also of the resinous, so that in this instance, the extract was a gum-resin. I am inclined to believe, that the bitter principle exists in a certain quantity, in the gum resin, and essential oil.

It is true the application of heat will evaporate the essential oil; and the aroma, to which the aromatic quality of the hop is owing, will be disengaged. As the intention of the hop, in the preparation of malt liquor, is to impart a bitter quality, the aroma and essential oil, in which the aromatic flavour resides, should also be preserved. This circumstance, therefore, ought to be attended to. Mr. Clemens suggested this idea to a brewer of this city; and observed, that in order to preserve the aroma and essential oil, a head, similar to a still-head, might be used.* The essential oil, may be re-

* Employing at the same time, a worm tub as a refrigeratory.

turned to the boiler, or, after the beer is formed, may be put in the casks.

By this means, the beer will have all the bitter and aromatic qualities. The facts therefore, resolve themselves into a few: in preparing a decoction of hop, if it be the intention to preserve the essential oil, or the aromatic part, the heat should be gradual and the vessel covered; consequently, in the preparation of beer, this circumstance should be attended to. For the purpose of medicine, the tincture prepared in the usual mode, is preferable to any other form.* During the formation and subsequent evaporation of the decoction of hop, a gritty precipitate began to appear. This, we may judge from a similar experiment with opium, consists of three distinct substances, resin, oxygenized extract, and the narcotic principle. The resin and narcotic principle are dissolved by alcohol. The bitter principle, like the narcotic, differs from other substances, in their chemical and other properties. Welther, and afterwards the learned Dr. Thomson examined this substance very carefully; and Mr. Hatchett has produced it synthetically, along with tan, by the action of nitric acid on indigo.

Whether the essential oil of hop contains all the virtues of the plant, no experiment has yet determined.

* I generally prepare the tincture of hop (following the principle of Dr. Drake in preparing the tincture of Foxg-love) by saturating a given quantity of alcohol. This formula I consider preferable, as it establishes a uniformity in the preparation.

The *Chenopodium Anthelminticum* of Linnæus for example, was employed for a long time in the form of decoction, before it was known that the virtues resided in an essential oil; but, at this day, it is known, that the essential oil contains all the properties of the plant. To Mr. Clemens we are indebted for a neat preparation of the oil now sold in the shops.

We do not profess, that the observation which relates to the essential oil of hop, in the preparation of malt liquor, is original; for I remember to have seen, in a periodical work,* the use of the essential oil recommended.

I was led to conclude, from the phenomena which uniformly occurs on the addition of water to the alcoholic tincture, by producing a *milkiness*, that a quantity of resin alone, was held in solution. The late Dr. Reynolds, whose abilities as a physician were well known, was also of the same opinion. The phenomena, however, ensues in consequence of a decomposition; for the separation of essential oil (which is soluble in alcohol) as well as any portion of resin must take place according to the laws of chemical affinity.

During the period when opium was so scarce, and consequently high, several medical gentlemen directed their attention to the hop as a substitute; the narcotic, anodyne, and other properties, which it possesses, did not escape their notice. These circumstances I briefly state to shew, that, should we be compelled to seek resources in our country, the genius of America will be called into redoubled action, and, like the

* The Free-Masons Magazine.

epocha of '76, evince, that "necessity is the mother of invention."*

In conclusion we may add, that much may be acquired from a series of experiments instituted with the view of obtaining information on the several properties and effects of this valuable plant; and much, no doubt, may be accomplished with respect to its application in brewing, an art in which, to the principles of chemistry, many improvements have been made. To our worthy and ingenious countryman, Mr. HARE, much praise is due for various improvements in this art, which, we may add, were in consequence of his correct principles in chemistry and natural philosophy.

* Respecting this circumstance much has been written; but no paper, shewing the correctness of this principle, is more lively delineated, than that of Dr. MORGAN; who, in an address to the trustees of the college of Philadelphia, many years since, animadverted in a very able and perspicuous manner on the resources of our country.

These facts, it may truly be said, serve to stamp on the American character, not only a knowledge of the productions of nature, which are rendered directly or indirectly subservient to the purposes of man, but that, in time of need, to call forth the energy of her countrymen to discoveries and improvements.